

IN THE CLAIMS:

Please cancel claims 1-43 of the application without prejudice to or disclaimer of the subject matter therein. In addition, please add new claims 44-64.

44. (New) An apparatus, comprising:

a panel having a contact surface and a sensor, the contact surface having a contact side and a non-contact side, the sensor being configured to produce a first signal based on a modification of a characteristic of the contact surface; and

a piezoelectric actuator coupled to the non-contact side of the contact surface, the piezoelectric actuator being configured to output a haptic force to the contact surface in response to a second signal, the second signal being in response to the first signal.

45. (New) The apparatus of claim 44, the piezoelectric actuator being a first piezoelectric actuator, the apparatus further comprising:

a second piezoelectric actuator, the second piezoelectric actuator being associated with a portion of the contact surface and being coupled to the non-contact side of the contact surface,

the first piezoelectric actuator being associated with a portion of the contact surface different from the portion of the contact surface associated with the second piezoelectric actuator.

46. (New) The apparatus of claim 44, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical user interface including an icon, a position of the icon within the graphical user interface substantially corresponding to the location of the piezoelectric actuator coupled to the contact surface.

47. (New) The apparatus of claim 44, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical user interface including an icon, a position of the icon within the graphical user

interface substantially corresponding to the location of the piezoelectric actuator coupled to the contact surface,

the icon being associated with a button function, the piezoelectric actuator being configured to output the haptic force such that the haptic force provides a physical confirmation of a selection of the button function.

48. (New) The apparatus of claim 44, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical environment including an icon, a position of the icon within the graphical environment substantially corresponding to the location of the piezoelectric actuator coupled to the contact surface,

the icon being associated with an event within the graphical environment, the piezoelectric actuator being configured to output the haptic force such that the haptic force is uniquely associated with the event.

49. (New) The apparatus of claim 44, further comprising:

a housing, the piezoelectric actuator and the panel being disposed within the housing;
a processor in communication with the sensor and the piezoelectric actuator, the processor being disposed within the housing, the processor configured to provide the second signal based on the first signal; and

a physical button disposed within the housing and in communication with the processor.

50. (New) The apparatus of claim 44, further comprising:

a first compliant member;
a second compliant member; and
a housing, the first compliant member and the second compliant member each being disposed between the non-contact side of the contact surface and the housing, the contact surface having one degree of freedom,

the piezoelectric actuator being directly coupled to the non-contact surface of the panel.

51. (New) An apparatus, comprising:

a panel having a contact surface and a sensor, the sensor being configured to produce a signal based on a first modification of a characteristic of the contact surface and a signal based on a second modification of a characteristic of the contact surface, the first modification being associated with a first portion of the contact surface, the second modification being associated with a second portion of the contact surface different from the first portion of the contact surface;

a first actuator coupled to the first portion of the contact surface, the first actuator being configured to output a haptic force to the first portion of the contact surface in response to an actuation signal, the actuation signal for the first actuator being based on the signal associated with the first modification; and

a second actuator coupled to the second portion of the contact surface, the second actuator being configured to output a haptic force to the second portion of the contact surface in response to an actuation signal, the actuation signal for the second actuator being based on the signal associated with the second modification.

52. (New) The apparatus of claim 51, wherein:

the first actuator is a first piezoelectric actuator; and

the second actuator is a second piezoelectric actuator.

53. (New) The apparatus of claim 51, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical user interface including an icon, a position of the icon within the graphical user interface substantially corresponding to the first portion of the contact surface.

54. (New) The apparatus of claim 51, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical user interface including an icon, a position of the icon within the graphical user interface substantially corresponding to the first portion of the contact surface,

the icon being associated with a button function, the first actuator being configured to output the haptic force such that the haptic force provides a physical confirmation of a selection of the button function.

55. (New) The apparatus of claim 51, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical environment including an icon, a position of the icon within the graphical environment substantially corresponding to the first portion of the contact surface,

the icon being associated with an event within the graphical environment, the actuator being configured to output the haptic force such that the haptic force is uniquely associated with the event.

56. (New) The apparatus of claim 51, further comprising:

a housing within which the first actuator, the second actuator and the panel is disposed;
a processor in communication with the sensor, the first actuator and the second actuator, the processor being disposed within the housing, the processor configured to provide the actuation signal for the first actuator based on the signal associated with the first modification, the processor configured to provide the actuation signal for the second actuator based on the signal associated with the second modification; and

a physical button disposed within the housing and in communication with the processor.

57. (New) The apparatus of claim 51, further comprising:

a first compliant member;
a second compliant member; and
a housing, the first compliant member and the second compliant member each being disposed between the panel and the housing, the panel having a degree of freedom,
the first actuator and the second actuator being directly coupled to the panel.

58. (New) An apparatus, comprising:

a panel having a contact surface and a sensor, the sensor being configured to produce a first signal based on a modification of a characteristic of the contact surface at a location in a first dimension and a second dimension of the contact surface; and

a piezoelectric actuator coupled at the location of the contact surface, the piezoelectric actuator being configured to output a haptic force to the contact surface in response to a second signal, the second signal being in response to the first signal, the haptic force being directed at the location of the contact surface and in a third dimension of the contact surface different from the first dimension and the second dimension.

59. (New) The apparatus of claim 58, the piezoelectric actuator being a first piezoelectric actuator, the apparatus further comprising:

a second piezoelectric actuator, the second piezoelectric actuator being associated with a portion of the contact surface,

the first piezoelectric actuator being associated with a portion of the contact surface different from the portion of the contact surface associated with the second piezoelectric actuator.

60. (New) The apparatus of claim 58, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical user interface including an icon, a position of the icon within the graphical user interface substantially corresponding to the location of the piezoelectric actuator coupled to the contact surface.

61. (New) The apparatus of claim 58, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical user interface including an icon, a position of the icon within the graphical user interface substantially corresponding to the location of the piezoelectric actuator coupled to the contact surface,

the icon being associated with a button function, the piezoelectric actuator being configured to output the haptic force such that the haptic force provides a physical confirmation of a selection of the button function.

62. (New) The apparatus of claim 58, further comprising:

a display screen coupled to the panel, the display screen being configured to display a graphical environment including an icon, a position of the icon within the graphical environment substantially corresponding to the location of the piezoelectric actuator coupled to the contact surface,

the icon being associated with an event within the graphical environment, the piezoelectric actuator being configured to output the haptic force such that the haptic force is uniquely associated with the event.

63. (New) The apparatus of claim 58, further comprising:

a housing, the piezoelectric actuator and the panel being disposed within the housing;

a processor in communication with the sensor and disposed within the housing, the processor configured to provide the second signal based on the first signal; and

a physical button disposed within the housing and in communication with the processor.

64. (New) The apparatus of claim 58, further comprising:

a first compliant member;

a second compliant member; and

a housing, the first compliant member and the second compliant member each being disposed between the panel and the housing, the panel having a degree of freedom along the third dimension,

the piezoelectric actuator being directly coupled to the panel.